

PATENT SPECIFICATION

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DRAWINGS ATTACHED

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(54) IMPROVEMENTS IN OR RELATING TO FILTERS

(71) We, CHEMAP AG., a Swiss Body Corporate, of 415 Alte Landstrasse, 8708 Männedorf, Switzerland, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to filters employing disc-shaped filter elements having a central filtrate outflow. The elements may be installed for use in filters in either horizontal or vertical geometry or in rotary filters and in filters which are abraded by solid particles passing over them under the influence of centrifugal force.

The invention consists in a filter comprising disc-shaped filter elements and a central filtrate outflow, wherein one or more support plates are secured to an annular hub or hubs surrounding a tube forming the said filtrate outflow, said hub or hubs being provided with outlet bores communicating with said tube and the outlets of the filter elements and said plate(s) supporting porous filtrate outflow discs, and a thin fine-pored filter is medium stretched over each of the latter, and wherein rings made of a resilient material are arranged on both sides of that part of the filter medium which projects into an annular recess defined at least partly by the hub or hubs so that that one side of said rings abut one face of said recess, whilst the other side of said rings abut the filter medium.

A set of such filtering elements may be mounted on a common filtrate outflow axis in a filtering apparatus in order to increase the output capacity. Liquid to be filtered is introduced into the filtering container and separated into residue and filtrate by means of the filtering media stretched over the members. The residue remains on the media, the filtrate is fed through the filtrate outflow discs to the openings in the hubs and passes through these latter into a drain tube on the filter axis. In order substantially to prevent fine particles

of the filter residue passing into the filtrate outflow, the filter medium has to be well sealed on the elements at the edge. To this end, for example, there may be provided a clamping ring having a U section.

In filters hitherto manufactured, the sealing rings, made from a resilient material, lie between two successive filtering elements or, with larger filters, between filtering elements and spacers, the hubs surrounding the central opening. The ring abuts the face of the adjacent hub or the spacer and on the other hand the fine filter cloth which itself rests on the filtrate outflow part constructed as perforated sheet or as coarse cloth. In this usual arrangement, the fine cloth is not pressed by the superposed seal at the points where it lies over a hole in the perforated sheet or an opening in the mesh of the coarse cloth but is pressed into the opening. Small channels or gaps can form due to the insufficient pressure at such points at which said particles can pass through the filtering elements and the filtrate outflow by by-passing the filtering medium. If there is great turbidity or a filtration with filtering aids, this disadvantage does not take effect because, after a short run, the particles block the passages or the filter cloth and then the filtrate is drained off clear. In the separation of the finest particles without filtering aids silting, for example in the separation of fine nickel catalytic agents in the salad oil industry, passage of the finest particulate solids must be excluded.

The arrangement of the invention avoids or minimises these disadvantages.

In order that the invention shall be more clearly understood, reference will now be made to the accompanying drawing which shows a part section through one embodiment thereof by way of example.

Referring to the drawing, a plurality of filtering elements separated by spacers 2 is arranged on hub members 1, said hubs being provided with radial filtrate outflow or drain bores 3. Support plates 4 in the form of annu-

[Price 25p]

lar discs are secured to the hub members, said discs being flanged on their outer peripheries into an S-shape and being formed with a dished recess to receive annular porous filtrate outflow discs 5 made of coarse supporting cloth and to support a perforated sheet 6 which is downwardly flanged at its outer periphery. Both parts are held by means of a detachable screw ring retaining device 7, although if desired, the device may be of bayonet catch form. Alternatively, the parts may be clamped in a clamping collar. The upper part of the hub 1 is shouldered to form an annular groove 8 into which projects the inner edge of a fine filter cloth 9, which is tightly connected at its outer periphery around the support plate 4 by means of a clamping ring 10. The surfaces of the hub parts and the spacers adjacent the annular groove 8 are provided with an annular recess 11 in which is fitted a sealing ring 12 of round section, often referred to as an O-ring. Shoulders 13 have the effect of centering the rings and defining stops when the elements are pressed together, so that the annular seals 12 are stretched together to a predetermined and equal extent; moreover, the compression of the seals from one filtering element to another is exactly the same and no uncontrollable leaks can occur. The filtering elements remain completely central on the hub parts and the spacers by means of the shouldered portions. The elements are pressed together in the usual manner by means of a clamping screw which is screwed onto a thread arranged on a perforated central tube which is not shown (see for example our prior Patent Specn. No. 1,075,970) and which is used as the filtrate drain or outflow.

40 The filtering medium is securely sealed by the arrangement according to the invention so that fine cloudy particles are substantially prevented from entering into the filtrate drain.

WHAT WE CLAIM IS:—

1. A filtrate comprising disc-shaped filter elements and a central filtrate outflow, wherein one or more support plates are secured to an annular hub or hubs surrounding a tube forming the said filtrate outflow, said hub or hubs being provided with outlet bores communicating with said tube and the outlets of the filter elements and said plate(s) supporting porous filtrate outflow discs, and a thin fine-pored filter medium is stretched over each of the latter, and wherein rings made of a resilient material are arranged on both sides of that part of the filter medium which projects into an annular recess defined at least partly by the hub or hubs so that one side of said rings abut one face of said recess, whilst the other side of said rings abut the filter medium.

2. A filter as claimed in claim 1, wherein a plurality of hubs is provided, said hubs being separated by spacer members, said hubs and said spacer members being arranged so that the peripheries of the filter elements lie in planes parallel to one another throughout the set of filter elements, whilst the sealing rings abutting the filter medium lie in grooves having predetermined clearance so that the various parts may be compressed to substantially the same extent.

3. A filter as claimed in claim 1 or 2, wherein the filtrate outflow discs are retained by means of a holding device detachably arranged on the hub and separated therefrom by means of an annular groove on the hub part.

4. Filters substantially as hereinbefore described with reference to the accompanying drawing.

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1 SHEET

COMPLETE SPECIFICATION

*This drawing is a reproduction of
the Original on a reduced scale*

